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EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.

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May 3, 1990

Dr. Merrill Eisenbud
711 Bayberry Drive
Chapel Hill, North Carolina 27514

Dear Dr. Eisenbud:

Attached are the answers to the questions of the Defense Nuclear Facilities Safety Board concerning the history of Pondcrete and its relation to americium.

In broad explanation of the answer to the questions, we do not consider that the Pondcrete storage on the 904 pad has caused an increase in americium readings in the 903 pad area. In fact, the americium noted in the EG&G Energy Services Radiation Survey done under contract to DOE in July 1989 is consistent with the earliest survey done in 1981 and is a growth from the plutonium 241 which was spilled in that area because of drum storage problems prior to 1969.

I have also attached an interesting study in the resuspension of particles.

I hope the information is helpful, and I am looking forward to providing you tours, briefings, and whatever additional information will help you inform and advise the Defense Nuclear Facilities Safety Board.


J. M. Kersh

Associate General Manager

acd

ADMIN RECORD

BZ-A-00210

Other Actions Taken

An investigation into the causes of the pondcrete problem occurrence showed:

- There were incorrect cement/sludge ratios in the sludge solidification process which resulted from inadequate process control of varying concentrations of solids in the sludge feed to the pug mill (where cement and sludge are mixed). It was also found that a star valve used to introduce cement into the mixer plugged intermittently, which prevented cement from being introduced into the process. It was determined that this condition existed as early as 1985, and that these incorrect ratios resulted in pondcrete, which did not cure beyond a putty consistency.

Although, this condition could have affected the 2000 pondcrete blocks that had already been shipped to NTS, these blocks were not checked because:

- o The blocks were already buried in pit 2 as low level waste,
 - o NTS did not experience any problems in stacking the tri-walls in the pit,
 - o The tracking of cement usage versus the tri-walls produced indicated that the earlier boxes had the most cement and the later boxes the least,
 - o Nevada was notified and approved the location of the pondcrete blocks, and
 - o The 28 boxes of pondcrete that were in transit to NTS when it was reclassified from low-level radioactive to mixed waste and subsequently stored above ground until interim status was received, was opened and verified by NTS that the boxes were acceptable before they were placed in pit 3.
- The fiberboard box degradation was attributed to weathering and a destabilized product caused by the boxes' exposure to moisture, because the tarpaulins covering the boxes of pondcrete were not completely weatherproof. Also, the tri-wall boxes used were found to be shipping containers, which were not designed for long term storage, especially of a non-solid product.
 - The quality control inspection procedures were inadequate to detect the incorrect cement/sludge ratios. Since no specific inspection criteria had been developed, there were no specifications developed to test for.

The determination and development of corrective action needed to address the pondcrete problem took place over a three month period and included such things as:

- The development of new performance criteria for pondcrete waste which includes the preparation, packaging, storage, shipping and disposal of pondcrete. This meant that the preparation of pondcrete waste boxes had to have acceptable control limits, that would meet performance criteria. These requirements were prepared and approved by July 22, 1988.
- Pad surveillance procedures were approved on July 25, 1988, until such time as all existing containers have been removed from the pad or reinspected and found satisfactory.
- Procedures were developed for all activities associated with the reprocessing of failed pondcrete boxes and approved on August 5, 1988.
- Qualifications standards were developed for pondcrete operations by September 1, 1988. Initial operator training commenced on September 16, 1988, and documentation of training and adherence was established by October 7, 1988.
- Procedures to test and inspect pondcrete products were completed and approved by September 16, 1988. The procedures called for the re-inspection of all pondcrete boxes before determination is made to ship or reprocess.

At the time the pondcrete slumping problem was discovered the May 1988 inventory showed that 16,882 pondcrete blocks were stored at Rocky Flats on pads 750 and 904. As of May 4, 1990, 9,376 pondcrete blocks have been shipped to NTS for storage, leaving 7,506 blocks which require remixing.

Question 2:

Evaluate the pondcrete deterioration as a cause of spread of contamination by americium within the bounds of the Rocky Flats Plant and on the nearby slopes.

Response:

Pondcrete did not contribute to americium contamination within the bounds of the Rocky Flats Plant or on the nearby slopes:

- o EG&G aerial radiological surveys conducted in 1981 showed americium contamination east of the 903 pad and within the bounds of the RFP, which is directly attributable to drum storage of plutonium/americium contaminated solvents at the 903 pad prior to 1969.**
- o Pondcrete was not stored at the 904 and 750 pads until 1986.**
- o EG&G aerial radiological surveys conducted in 1989 also reflected americium contamination east of the 903 pad, but did not show any changes due to pondcrete storage. This supports measurements of plutonium concentrations in pondcrete, which are not high enough to impact these americium levels. Low-level gamma readings were noted by the survey on the 904 and 750 pads, the sites of pondcrete storage, but the americium contours were unaffected.**
- o Four years of pondcrete storage at the 750 and 904 pads have not been shown to contribute to americium contamination in the soils. The 1981 and 1989 surveys were consistent and showed no plumes have been generated from the pads.**

Furthermore: Offsite soil contamination immediately east of RFP, which covers an area of about 350 acres, has been undergoing remediation since 1986 due to plutonium contamination levels of as much as 15 dpm/g which is above the state standard of 2 dpm/g. Land management programs include plowing, disking and reseedling, and have reduced levels to <2 dpm/g. Continuing land management programs have been shown to effectively reduce soil contamination levels. For reference, the EPA screening levels for plutonium in soil have been set at 44.4 dpm/g.

Question 3:

Evaluate the Health Physics implications of the americium contamination that exists at Rocky Flats.

Response:

There are no measurable health risks to the public. As discussed in the response to question #2, americium contamination is not attributable to pondcrete. The americium contaminated areas at RFP are subject to limited/restricted access and administrative controls. Studies over the last 10 years on resuspension potential show limited but localized resuspension at very low levels. Air monitoring at 23 locations around RFP show airborne radioactive contamination does not exceed more than 10% of the DOE derived concentration limits at the plant, and are much lower (<0.1%) at plant boundaries. Because of the access controls at contaminated-soil areas, and limited Pu/Am migration potential, there are no measurable health risks to the public.

Question 4:

Estimate to what extent further deterioration of pondcrete may lead to spread of americium contamination at the new storage location at the Nevada Test Site.

Response:

Pondcrete would not be expected to deteriorate at NTS, nor result in any spread of americium contamination. As answered in questions #2; and #3, pondcrete has not led to the spread of americium contamination at Rocky Flats Plant. Pondcrete is tested for acceptable solidification at RFP, crated and shipped to NTS where it is buried, and not disposed of above ground, as at RFP; therefore, we estimate neither deterioration nor spread of americium contamination at NTS.